RAW SEQUENCE LISTING

The Biotechnology Systems Branch of the Scientific and Technical Information Center (STIC) no errors detected.

Application Serial Number: _10/751,702A_

Source: _1FW/6_

Date Processed by STIC: _1/19/07_

ENTERED

CRF Errors Edited by the STIC Systems Branch

Serial Number: _10/751, 702A_ CRF Edit Date: _1/19/07_
Edited by: _AV_

____ Realigned nucleic acid/amino acid numbers/text in cases where the sequence
text "wrapped" to the next line

✓ Corrected the SEQ ID NO. Sequence numbers edited were:

_40_____

____ Inserted or corrected a nucleic number at the end of a nucleic line. SEQ ID
NO's edited:

_____

____ Deleted: ___ invalid beginning/end-of-file text ; ___ page numbers

____ Inserted mandatory headings/numeric identifiers, specifically:

_____

____ Moved responses to same line as heading/numeric identifier, specifically:

_____

____ Other:

_____
_____
_____

Revised 09/09/2003

RAW SEQUENCE LISTING   DATE: 01/19/2007
PATENT APPLICATION: US/10/751,702A   TIME: 12:27:27

Input Set : **A:\PTO.txt**
Output Set: **N:\CRF4\01192007\J751702A.raw**

```
 3 <110> APPLICANT: Tuomanen, Elaine I
 4         Wizemann, Theresa M.
 5         Masure, H. R.
 6         Johnson, Leslie S.
 7         Koenig, Scott
 9 <120> TITLE OF INVENTION: POLYPEPTIDE COMPRISING THE AMINO ACID OF AN N-TERMINAL
10         CHOLINE BINDING PROTEIN A TRUNCATE, VACCINE DERIVED
11         THEREFROM AND USES THEREOF
13 <130> FILE REFERENCE: 044158/273011
15 <140> CURRENT APPLICATION NUMBER: 10/751,702A
16 <141> CURRENT FILING DATE: 2004-01-05
18 <150> PRIOR APPLICATION NUMBER: 09/056,019
19 <151> PRIOR FILING DATE: 1998-04-07
21 <160> NUMBER OF SEQ ID NOS: 42
23 <170> SOFTWARE: PatentIn Ver. 2.0
25 <210> SEQ ID NO: 1
26 <211> LENGTH: 406
27 <212> TYPE: PRT
28 <213> ORGANISM: Streptococcus pneumoniae
30 <400> SEQUENCE: 1
31 Glu Asn Glu Gly Ala Thr Gln Val Pro Thr Ser Ser Asn Arg Ala Asn
32  1               5                  10                  15
34 Glu Ser Gln Ala Glu Gln Gly Glu Gln Pro Lys Lys Leu Asp Ser Glu
35              20                  25                  30
37 Arg Asp Lys Ala Arg Lys Glu Val Glu Glu Tyr Val Lys Lys Ile Val
38          35                  40                  45
40 Gly Glu Ser Tyr Ala Lys Ser Thr Lys Lys Arg His Thr Ile Thr Val
41      50                  55                  60
43 Ala Leu Val Asn Glu Leu Asn Asn Ile Lys Asn Glu Tyr Leu Asn Lys
44  65                  70                  75                  80
46 Ile Val Glu Ser Thr Ser Glu Ser Gln Leu Gln Ile Leu Met Met Glu
47                  85                  90                  95
49 Ser Arg Ser Lys Val Asp Glu Ala Val Ser Lys Phe Glu Lys Asp Ser
50              100                 105                 110
52 Ser Ser Ser Ser Ser Ser Asp Ser Ser Thr Lys Pro Glu Ala Ser Asp
53              115                 120                 125
55 Thr Ala Lys Pro Asn Lys Pro Thr Glu Pro Gly Glu Lys Val Ala Glu
56      130                 135                 140
58 Ala Lys Lys Lys Val Glu Glu Ala Glu Lys Lys Ala Lys Asp Gln Lys
59 145                 150                 155                 160
61 Glu Glu Asp Arg Arg Asn Tyr Pro Thr Ile Thr Tyr Lys Thr Leu Glu
62              165                 170                 175
64 Leu Glu Ile Ala Glu Ser Asp Val Glu Val Lys Lys Ala Glu Leu Glu
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RAW SEQUENCE LISTING   DATE: 01/19/2007
PATENT APPLICATION: US/10/751,702A   TIME: 12:27:27

Input Set : **A:\PTO.txt**
Output Set: **N:\CRF4\01192007\J751702A.raw**

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65               180                185                190
67 Leu Val Lys Val Lys Ala Asn Glu Pro Arg Asp Glu Gln Lys Ile Lys
68         195                200                205
70 Gln Ala Glu Ala Glu Val Glu Ser Lys Gln Ala Glu Ala Thr Arg Leu
71     210                215                220
73 Lys Lys Ile Lys Thr Asp Arg Glu Glu Ala Glu Glu Glu Ala Lys Arg
74 225                230                235                240
76 Arg Ala Asp Ala Lys Glu Gln Gly Lys Pro Lys Gly Arg Ala Lys Arg
77             245                250                255
79 Gly Val Pro Gly Glu Leu Ala Thr Pro Asp Lys Lys Glu Asn Asp Ala
80             260                265                270
82 Lys Ser Ser Asp Ser Ser Val Gly Glu Glu Thr Leu Pro Ser Pro Ser
83         275                280                285
85 Leu Lys Pro Glu Lys Lys Val Ala Glu Ala Glu Lys Lys Val Glu Glu
86     290                295                300
88 Ala Lys Lys Lys Ala Glu Asp Gln Lys Glu Glu Asp Arg Arg Asn Tyr
89 305                310                315                320
91 Pro Thr Asn Thr Tyr Lys Thr Leu Glu Leu Glu Ile Ala Glu Ser Asp
92             325                330                335
94 Val Glu Val Lys Lys Ala Glu Leu Glu Leu Val Lys Glu Glu Ala Lys
95         340                345                350
97 Glu Pro Arg Asn Glu Glu Lys Val Lys Gln Ala Lys Ala Glu Val Glu
98     355                360                365
100 Ser Lys Lys Ala Glu Ala Thr Arg Leu Glu Lys Ile Lys Thr Asp Arg
101     370                375                380
103 Lys Lys Ala Glu Glu Glu Ala Lys Arg Lys Ala Ala Glu Glu Asp Lys
104 385                390                395                400
106 Val Lys Glu Lys Pro Ala
107             405
110 <210> SEQ ID NO: 2
111 <211> LENGTH: 655
112 <212> TYPE: PRT
113 <213> ORGANISM: Streptococcus pneumoniae
115 <400> SEQUENCE: 2
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117   1                5                10                15
119 Glu Ser Gln Ala Glu Gln Gly Glu Gln Pro Lys Lys Leu Asp Ser Glu
120             20                25                30
122 Arg Asp Lys Ala Arg Lys Glu Val Glu Glu Tyr Val Lys Lys Ile Val
123         35                40                45
125 Gly Glu Ser Tyr Ala Lys Ser Thr Lys Lys Arg His Thr Ile Thr Val
126     50                55                60
128 Ala Leu Val Asn Glu Leu Asn Asn Ile Lys Asn Glu Tyr Leu Asn Lys
129 65                70                75                80
131 Ile Val Glu Ser Thr Ser Glu Ser Gln Leu Gln Ile Leu Met Met Glu
132             85                90                95
134 Ser Arg Ser Lys Val Asp Glu Ala Val Ser Lys Phe Glu Lys Asp Ser
135         100                105                110
137 Ser Ser Ser Ser Ser Ser Asp Ser Ser Thr Lys Pro Glu Ala Ser Asp
```

```
138           115                    120                    125
140 Thr Ala Lys Pro Asn Lys Pro Thr Glu Pro Gly Glu Lys Val Ala Glu
141       130                    135                    140
143 Ala Lys Lys Lys Val Glu Glu Ala Glu Lys Lys Ala Lys Asp Gln Lys
144 145                    150                    155                    160
146 Glu Glu Asp Arg Arg Asn Tyr Pro Thr Ile Thr Tyr Lys Thr Leu Glu
147               165                    170                    175
149 Leu Glu Ile Ala Glu Ser Asp Val Glu Val Lys Lys Ala Glu Leu Glu
150 .             180                    185                    190
152 Leu Val Lys Val Lys Ala Asn Glu Pro Arg Asp Glu Gln Lys Ile Lys
153           195                    200                    205
155 Gln Ala Glu Ala Glu Val Glu Ser Lys Gln Ala Glu Ala Thr Arg Leu
156       210                    215                    220
158 Lys Lys Ile Lys Thr Asp Arg Glu Glu Ala Glu Glu Glu Ala Lys Arg
159 225                    230                    235                    240
161 Arg Ala Asp Ala Lys Glu Gln Gly Lys Pro Lys Gly Arg Ala Lys Arg
162               245                    250                    255
164 Gly Val Pro Gly Glu Leu Ala Thr Pro Asp Lys Lys Glu Asn Asp Ala
165           260                    265                    270
167 Lys Ser Ser Asp Ser Ser Val Gly Glu Glu Thr Leu Pro Ser Pro Ser
168           275                    280                    285
170 Leu Lys Pro Glu Lys Lys Val Ala Glu Ala Glu Lys Lys Val Glu Glu
171     290                    295                    300
173 Ala Lys Lys Lys Ala Glu Asp Gln Lys Glu Glu Asp Arg Arg Asn Tyr
174 305                    310                    315                    320
176 Pro Thr Asn Thr Tyr Lys Thr Leu Glu Leu Glu Ile Ala Glu Ser Asp
177               325                    330                    335
179 Val Glu Val Lys Lys Ala Glu Leu Glu Leu Val Lys Glu Glu Ala Lys
180           340                    345                    350
182 Glu Pro Arg Asn Glu Glu Lys Val Lys Gln Ala Lys Ala Glu Val Glu
183           355                    360                    365
185 Ser Lys Lys Ala Glu Ala Thr Arg Leu Glu Lys Ile Lys Thr Asp Arg
186     370                    375                    380
188 Lys Lys Ala Glu Glu Glu Ala Lys Arg Lys Ala Ala Glu Glu Asp Lys
189 385                    390                    395                    400
191 Val Lys Glu Lys Pro Ala Glu Gln Pro Gln Pro Ala Pro Ala Pro Lys
192           405                    410                    415
194 Ala Glu Lys Pro Ala Pro Ala Pro Lys Pro Glu Asn Pro Ala Glu Gln
195           420                    425                    430
197 Pro Lys Ala Glu Lys Pro Ala Asp Gln Gln Ala Glu Glu Asp Tyr Ala
198           435                    440                    445
200 Arg Arg Ser Glu Glu Glu Tyr Asn Arg Leu Thr Gln Gln Gln Pro Pro
201     450                    455                    460
203 Lys Thr Glu Lys Pro Ala Gln Pro Ser Thr Pro Lys Thr Gly Trp Lys
204 465                    470                    475                    480
206 Gln Glu Asn Gly Met Trp Tyr Phe Tyr Asn Thr Asp Gly Ser Met Ala
207           485                    490                    495
209 Thr Gly Trp Leu Gln Asn Asn Gly Ser Trp Tyr Tyr Leu Asn Ser Asn
210           500                    505                    510
```

```
212 Gly Ala Met Ala Thr Gly Trp Leu Gln Asn Asn Gly Ser Trp Tyr Tyr
213         515             520             525
215 Leu Asn Ala Asn Gly Ser Met Ala Thr Gly Trp Leu Gln Asn Asn Gly
216     530             535             540
218 Ser Trp Tyr Tyr Leu Asn Ala Asn Gly Ser Met Ala Thr Gly Trp Leu
219 545             550             555             560
221 Gln Tyr Asn Gly Ser Trp Tyr Tyr Leu Asn Ala Asn Gly Ser Met Ala
222             565             570             575
224 Thr Gly Trp Leu Gln Tyr Asn Gly Ser Trp Tyr Tyr Leu Asn Ala Asn
225         580             585             590
227 Gly Asp Met Ala Thr Gly Trp Val Lys Asp Gly Asp Thr Trp Tyr Tyr
228         595             600             605
230 Leu Glu Ala Ser Gly Ala Met Lys Ala Ser Gln Trp Phe Lys Val Ser
231     610             615             620
233 Asp Lys Trp Tyr Tyr Val Asn Gly Ser Gly Ala Leu Ala Val Asn Thr
234 625             630             635             640
236 Thr Val Asp Gly Tyr Gly Val Asn Ala Asn Gly Glu Trp Val Asn
237             645             650             655
240 <210> SEQ ID NO: 3
241 <211> LENGTH: 284
242 <212> TYPE: PRT
243 <213> ORGANISM: Streptococcus pneumoniae
245 <400> SEQUENCE: 3
246 Glu Asn Glu Gly Ala Thr Gln Val Pro Thr Ser Ser Asn Arg Ala Asn
247 1               5               10              15
249 Glu Ser Gln Ala Glu Gln Gly Glu Gln Pro Lys Lys Leu Asp Ser Glu
250             20              25              30
252 Arg Asp Lys Ala Arg Lys Glu Val Glu Glu Tyr Val Lys Lys Ile Val
253         35              40              45
255 Gly Glu Ser Tyr Ala Lys Ser Thr Lys Lys Arg His Thr Ile Thr Val
256         50              55              60
258 Ala Leu Val Asn Glu Leu Asn Asn Ile Lys Asn Glu Tyr Leu Asn Lys
259 65              70              75              80
261 Ile Val Glu Ser Thr Ser Glu Ser Gln Leu Gln Ile Leu Met Met Glu
262             85              90              95
264 Ser Arg Ser Lys Val Asp Glu Ala Val Ser Lys Phe Glu Lys Asp Ser
265             100             105             110
267 Ser Ser Ser Ser Ser Ser Asp Ser Ser Thr Lys Pro Glu Ala Ser Asp
268         115             120             125
270 Thr Ala Lys Pro Asn Lys Pro Thr Glu Pro Gly Glu Lys Val Ala Glu
271     130             135             140
273 Ala Lys Lys Lys Val Glu Glu Ala Glu Lys Lys Ala Lys Asp Gln Lys
274 145             150             155             160
276 Glu Glu Asp Arg Arg Asn Tyr Pro Thr Ile Thr Tyr Lys Thr Leu Glu
277             165             170             175
279 Leu Glu Ile Ala Glu Ser Asp Val Glu Val Lys Lys Ala Glu Leu Glu
280             180             185             190
282 Leu Val Lys Val Lys Ala Asn Glu Pro Arg Asp Glu Gln Lys Ile Lys
283             195             200             205
```

Input Set : A:\PTO.txt
Output Set: N:\CRF4\01192007\J751702A.raw

285 Gln Ala Glu Ala Glu Val Glu Ser Lys Gln Ala Glu Ala Thr Arg Leu
286   210   215   220
288 Lys Lys Ile Lys Thr Asp Arg Glu Glu Ala Glu Glu Glu Ala Lys Arg
289 225   230   235   240
291 Arg Ala Asp Ala Lys Glu Gln Gly Lys Pro Lys Gly Arg Ala Lys Arg
292   245   250   255
294 Gly Val Pro Gly Glu Leu Ala Thr Pro Asp Lys Lys Glu Asn Asp Ala
295   260   265   270
297 Lys Ser Ser Asp Ser Ser Val Gly Glu Glu Thr Leu
298   275   280
301 <210> SEQ ID NO: 4
302 <211> LENGTH: 106
303 <212> TYPE: PRT
304 <213> ORGANISM: Streptococcus pneumoniae
306 <400> SEQUENCE: 4
307 Lys Pro Glu Lys Lys Val Ala Glu Ala Glu Lys Lys Val Glu Glu Ala
308   1   5   10   15
310 Lys Lys Lys Ala Glu Asp Gln Lys Glu Glu Asp Arg Arg Asn Tyr Pro
311   20   25   30
313 Thr Asn Thr Tyr Lys Thr Leu Glu Leu Glu Ile Ala Glu Ser Asp Val
314   35   40   45
316 Glu Val Lys Lys Ala Glu Leu Glu Leu Val Lys Glu Glu Ala Lys Glu
317   50   55   60
319 Pro Arg Asn Glu Glu Lys Val Lys Gln Ala Lys Ala Glu Val Glu Ser
320 65   70   75   80
322 Lys Lys Ala Glu Ala Thr Arg Leu Glu Lys Ile Lys Thr Asp Arg Lys
323   85   90   95
325 Lys Ala Glu Glu Glu Ala Lys Arg Lys Ala
326   100   105
329 <210> SEQ ID NO: 5
330 <211> LENGTH: 109
331 <212> TYPE: PRT
332 <213> ORGANISM: Streptococcus pneumoniae
334 <400> SEQUENCE: 5
335 Thr Glu Pro Gly Glu Lys Val Ala Glu Ala Lys Lys Lys Val Glu Glu
336   1   5   10   15
338 Ala Glu Lys Lys Ala Lys Asp Gln Lys Glu Glu Asp Arg Arg Asn Tyr
339   20   25   30
341 Pro Thr Ile Thr Tyr Lys Thr Leu Glu Leu Glu Ile Ala Glu Ser Asp
342   35   40   45
344 Val Glu Val Lys Lys Ala Glu Leu Glu Leu Val Lys Val Lys Ala Asn
345   50   55   60
347 Glu Pro Arg Asp Glu Gln Lys Ile Lys Gln Ala Glu Ala Glu Val Glu
348 65   70   75   80
350 Ser Lys Gln Ala Glu Ala Thr Arg Leu Lys Lys Ile Lys Thr Asp Arg
351   85   90   95
353 Glu Glu Ala Glu Glu Glu Ala Lys Arg Arg Ala Asp Ala
354   100   105
357 <210> SEQ ID NO: 6

RAW SEQUENCE LISTING ERROR SUMMARY   DATE: 01/19/2007
PATENT APPLICATION: US/10/751,702A   TIME: 12:27:28

Input Set : A:\PTO.txt
Output Set: N:\CRF4\01192007\J751702A.raw

FJI

Please Note:
Use of n and/or Xaa have been detected in the Sequence Listing. Please review the
Sequence Listing to ensure that a corresponding explanation is presented in the <220>
to <223> fields of each sequence which presents at least one n or Xaa.

Seq#:6; Xaa Pos. 2,3
Seq#:27; Xaa Pos. 1
Seq#:28; Xaa Pos. 243
Seq#:40; Xaa Pos. 1,44,45,46,47,48,49,50,51,52,53,54,64,65,66,68,69,114,115
Seq#:40; Xaa Pos. 116,131,132,133,134,135,136,137,138,139,140,141,142,143
Seq#:40; Xaa Pos. 144,145,146,147,148,149,150,151,173,174,175,176,177,178
Seq#:40; Xaa Pos. 179,262,275,276,277,281,428,470

Input Set : **A:\PTO.txt**
Output Set: **N:\CRF4\01192007\J751702A.raw**

```
L:369 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:6 after pos.:0
L:1102 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:27 after pos.:0
L:1162 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:28 after pos.:240
L:2202 M:281 W: Numeric Fields not Ordered, <221> Sort in ascending order!
L:2209 M:258 W: Mandatory Feature missing, <220> Tag not found for SEQ ID#:40
L:2213 M:258 W: Mandatory Feature missing, <220> Tag not found for SEQ ID#:40
L:2214 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:40 after pos.:0
M:341 Repeated in SeqNo=40
L:2288 M:281 W: Numeric Fields not Ordered, <221> Sort in ascending order!
L:2292 M:258 W: Mandatory Feature missing, <220> Tag not found for SEQ ID#:41
L:2296 M:258 W: Mandatory Feature missing, <220> Tag not found for SEQ ID#:41
L:2300 M:258 W: Mandatory Feature missing, <220> Tag not found for SEQ ID#:41
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Raw Sequence Listing before editing
(for reference only)

RAW SEQUENCE LISTING   DATE: 01/17/2007
PATENT APPLICATION: US/10/751,702A   TIME: 14:32:16

Input Set : **A:\seq list 1-11-97.txt**
Output Set: **N:\CRF4\01172007\J751702A.raw**

```
 3 <110> APPLICANT: Tuomanen, Elaine I
 4        Wizemann, Theresa M.
 5        Masure, H. R.
 6        Johnson, Leslie S.
 7        Koenig, Scott
 9 <120> TITLE OF INVENTION: POLYPEPTIDE COMPRISING THE AMINO ACID OF AN N-TERMINAL
10        CHOLINE BINDING PROTEIN A TRUNCATE, VACCINE DERIVED
11        THEREFROM AND USES THEREOF
13 <130> FILE REFERENCE: 044158/273011
15 <140> CURRENT APPLICATION NUMBER: 10/751,702A
16 <141> CURRENT FILING DATE: 2004-01-05
18 <150> PRIOR APPLICATION NUMBER: 09/056,019
19 <151> PRIOR FILING DATE: 1998-04-07
21 <160> NUMBER OF SEQ ID NOS: 42
23 <170> SOFTWARE: PatentIn Ver. 2.0
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ERRORED SEQUENCES

VERIFICATION SUMMARY
PATENT APPLICATION: **US/10/751,702A**

DATE: 01/17/2007
TIME: 14:32:17

Input Set : **A:\seq list 1-11-97.txt**
Output Set: **N:\CRF4\01172007\J751702A.raw**

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L:369 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:6 after pos.:0
L:1102 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:27 after pos.:0
L:1162 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:28 after pos.:240
L:2202 M:281 W: Numeric Fields not Ordered, <221> Sort in ascending order!
L:2209 M:258 W: Mandatory Feature missing, <220> Tag not found for SEQ ID#:40
L:2213 M:258 W: Mandatory Feature missing, <220> Tag not found for SEQ ID#:40
L:2213 M:212 E: (34) Invalid or duplicate Sequence ID Number, SEQUENCE ID NOS:40 differs:1
L:2214 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:1 after pos.:0
M:341 Repeated in SeqNo=40
L:2288 M:281 W: Numeric Fields not Ordered, <221> Sort in ascending order!
L:2292 M:258 W: Mandatory Feature missing, <220> Tag not found for SEQ ID#:41
L:2296 M:258 W: Mandatory Feature missing, <220> Tag not found for SEQ ID#:41
L:2300 M:258 W: Mandatory Feature missing, <220> Tag not found for SEQ ID#:41
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<210> 40
<211> 492
<212> PRT
<213> Artificial Sequence

<220>
<223> consensus sequence for CbpA N-terminal region

<221> VARIANT
<222> 1, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 64, 65, 66,
68, 69, 114, 115, 116, 131, 132, 133, 134, 135, 136, 137,
138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149,
150, 151, 173, 174, 175, 176, 177, 178, 179, 262, 275
<223> Xaa = Any Amino Acid or other (i.e., deletion)

<221> VARIANT
<222> 276, 277, 281, 428, 470
<223> Xaa = Any Amino Acid or other (i.e., deletion)

<400> ① 40 ← change to
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